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TRANSMITTAL OF THE ANNUAL THREATENED AND ENDANGERED SPECIES REPORT
- CSE-0100-96

The Annual Threatened and Endangered Species Report for the Rocky Flats Environmental Technology Site is enclosed. This report is from Activity Number RZB87A1010 of the Natural Resource Protection and Compliance Program. The baseline date for this report is June 30, 1996.

If I can be of further assistance, please call me at extension 3199 or Marcia Murdock at extension 3560.

C S Evans
Remediation Manager
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MBM cb

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J D Krause
M B Murdock
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**ANNUAL THREATENED AND ENDANGERED SPECIES REPORT
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE**

NATURAL RESOURCE PROTECTION AND COMPLIANCE PROGRAM

A report on the presence, numbers, and area use of the Rocky Flats Environmental Technology Site by threatened, endangered, and other special-concern species

Rocky Mountain Remediation Services, L.L.C.

June 17, 1996

Introduction

Rocky Flats Environmental Technology Site (Site) is located on approximately 6,262 acres in northern Jefferson County, between Denver and Boulder, Colorado. Approximately 384 acres of the Site are a developed Industrial Area including buildings, parking areas, roads, and other structures. The remaining acreage consists of an undeveloped Buffer Zone surrounding the Industrial Area.

The Site, due to its geographical position between the Great Plains and the Front Range of the Rocky Mountains, includes a great diversity of terrain and provides a wide variety of wildlife habitats. The wide range of habitats within the Buffer Zone of the Site provides year-round and seasonal homes to a large number of wildlife species, including several threatened, endangered and other special-concern (sensitive) species.

To facilitate monitoring the status of federal and state species of concern, RMRS Ecology maintains a list of such species with potential to occur at the Site. This list includes special-concern species that have been recorded at the Site, or whose ranges encompass the vicinity and for which suitable habitat exists at the Site. Table 1 presents the Site's current "search-list" of special-concern species that has been revised to include species of particular concern in Colorado and nationally as of June 1996. This list is updated annually or when the protected status of included species are elevated or downgraded by U.S. Fish and Wildlife Service (USFWS).

Special-concern species are a particular class of wildlife and plants that are of special interest at the Site due to their protected status. The Natural Resource Protection and Compliance Program (NRPCP) tracks presence, locations, and numbers of individuals of these species to better ensure the Site's compliance with the *Endangered Species Act* (USC 1973), *Migratory Bird Treaty Act* (USC 1973a), the *Bald and Golden Eagle Protection Act* (USC 1978), the *Fish and Wildlife Coordination Act* (USC 1958), and the *Colorado Non-Game, Threatened, and Endangered Species Conservation Act* (CO 1991), all of which provide these species with special protection. For the purposes of the NRPCP monitoring program, these special-concern species are defined as plant and animal species that are listed by the USFWS as threatened or endangered, species that have been proposed by the USFWS for listing as threatened or endangered, species identified by the USFWS as C-1 candidates for listing, species formerly listed by the USFWS as C-2 candidate species, State of Colorado threatened, endangered, or Species of Special Concern, and some species that are "watch-listed" by the Colorado Natural Heritage Program. While the majority of the special-concern species with potential to occur at the Site are animal species, a few plant species are also included. In addition to routine monitoring of the entire Site for the presence of these species, NRPCP site-specific surveys are performed for these species and their potential habitats where any destructive work may occur.

Routine monitoring for special-concern species is conducted in accordance with methods described in *EMD Operating Procedures, Volume V Ecology* (DOE 1994a). Site-specific surveys for special-concern species are performed in accordance with the ecology procedure for *Identification and Protection of Threatened, Endangered, and Special-Concern Species* (1-D06-EPR-END 03) (DOE 1994b). Locations for site-specific surveys are determined by the work plans for construction, assessment, and remediation projects.

The following discussions of the special-concern species, broken into protection status groups, are based on data collected over the past four years (1993-1996). Table 2 presents a combined seasonal summary of observations of these species during the 1993-1995 observation period. Figures 1 through 4 show locations of observations of these species, indicating the seasonal importance of certain locations at the Site. Data used to produce these maps were reported in the 1993 Resource Protection Program Annual Report (DOE 1994c), the 1994 Annual Wildlife Survey Report (DOE 1995), and the 1995 Annual Wildlife Survey Report (DOE 1996b).

Federal Endangered Species

American peregrine falcons (*Falco peregrinus*), federally listed as an endangered species, are observed seasonally at the Site. A pair of peregrine falcons has nested in the Flatirons, a few miles to the northwest of the Site, for several years. This species uses the Buffer Zone as casual foraging range during the spring, summer, and fall. Peregrine falcons are observed on-site periodically, and the remains of a mallard hen found near one of the ponds showed indications that it may have been prey to a falcon. Peregrine falcons have previously been observed hunting in the Walnut Creek drainage (DOE 1992). While no appropriate nesting habitat exists at the Site, it is apparent that the foraging range of the peregrine falcons includes the Buffer Zone.

Federal Threatened Species

Bald eagles (*Haliaeetus leucocephalus*) were recently down-listed from endangered to threatened. Down-listing did not change the protected status of the bald eagle. Although most of the bald eagles observed on-site have been in transit across the Site, several were flying low in the interior, and were observed searching for available prey items. One immature bird was observed perched on a cottonwood tree in upper Woman Creek early one morning and may have roosted overnight at that location. The Site is considered an opportunistic foraging area for bald eagles. The only bald eagle nest in the Rocky Flats vicinity is at Standley Lake. Until the spring of 1996 this nest had not produced young. As of this writing, a single male bald eagle nestling is being attended by the Standley Lake pair.

Appropriate habitat exists at the Site for Ute Ladies'-tresses (*Spiranthes diluvialis*), a threatened orchid species known to occur approximately eight miles to the north of the Site in Boulder County. Searches in 1992, 1993 (ESCO 1993a), and 1994 (ESCO 1994), however, have failed to identify any individuals at the Site.

Federal Candidate Species

In February 1996 the USFWS published a new listing of candidate species that now **only** includes species **proposed** for listing and **C-1 candidate** species (USFWS 1996). No proposed or C-1 candidate species have been documented at the Site.

Other Special-Concern Species

There are, however, 11 other special-concern species documented at the Site, including nine former C-2 species and two Colorado Species of Special Concern. The search-list (Table 1)

includes these species because they may be upgraded to C-1 or listed species at any time. The former C-2 candidate species include the eastern short horned lizard (*Phrynosoma douglassii brevirostra*), the loggerhead shrike (*Lanius ludovicianus*), the western burrowing owl (*Athene cunicularia hypugea*), the northern goshawk (*Accipiter gentilis*), the Baird's sparrow (*Ammodramus bairdii*), the small-footed myotis (*Myotis subulatus*), the ferruginous hawk (*Buteo regalis*), the black swift (*Cypseloides niger*), and the Preble's meadow jumping mouse (*Zapus hudsonius prebleii*). Colorado Species of Special Concern using the Site include the long-billed curlew (*Numenius americanus*) and the American white pelican (*Pelecanus erythrorhynchos*). Sandhill cranes (*Grus canadensis*) frequently fly over the Site during migration, but whether this is the greater sandhill crane subspecies listed as a Colorado Species of Special Concern has not been determined.

Former C-2 Candidate Species

The eastern short horned lizard is recorded sporadically in xeric mixed grassland habitat, but is uncommon enough that it is rarely observed. Xeric mixed grasslands are found predominantly in the western third of the Site, where surficial deposits of Rocky Flats Alluvium occur, with fingers of the habitat extending eastward along the ridges of the pediment. These small, inconspicuous lizards have been recorded sitewide, but their secretive habits makes accurate population estimation difficult without a thorough search for the species.

Small numbers of loggerhead shrikes are observed year-round at the Site. They are suspected to breed in shrublands, particularly tall upland shrublands, however, no nesting has been confirmed. Loggerhead shrikes are most commonly observed at the edges of grasslands where they adjoin woodlands and shrublands.

Western burrowing owls have been observed in prairie dog colonies at the Site and in areas immediately adjacent along the north and east boundaries of the Site. Recent historic records show nesting burrowing owls in an area, now owned by Boulder County Open Space, immediately northeast of the Site (pers. comm. J. George, CDOW). No breeding activity on the Site has been confirmed, however, the owls were present during the breeding season.

Northern goshawks are occasional visitors to the Site, largely during migration. Three observations of this species have been recorded in recent years. There is little appropriate habitat to support this forest dwelling species at the Site other than as a casual visitor.

Baird's sparrow has been recorded only once at the site in shrubland habitat. Black swifts were recorded once over xeric tallgrass prairie. A small-footed myotis (bat) was recorded once in the entryway of a building within the Industrial Area.

Ferruginous hawks are fall and winter residents of the Site and the surrounding vicinity. The numbers of ferruginous hawks using the Site during the winters of 1994-95 and 1995-96 were down compared to previous winters. The presumed cause of this dip in Ferruginous hawk numbers was a prairie dog die-off resulting from a plague epizootic in Boulder, Jefferson, and Adams Counties. The prairie dogs have been extirpated from the Site and the immediate vicinity, though colonies further to the south and southeast were not affected. These and other raptors most probably concentrated nearer the remaining food resource. The Site is most important to ferruginous hawks as winter range. No nesting of this species has been confirmed for the Site,

although ferruginous hawks have been reported as present at the Site during the breeding season

Until February 1996, the Preble's meadow jumping mouse was identified by the USFWS as a C-2 candidate species. The mouse is currently not on the priority list of proposed and C-1 species published in February 1996 (USFWS 1996). The mouse is, however, currently under review by the USFWS for listing as threatened or endangered in response to a petition to list the species. Because the USFWS is currently prioritizing proposed species and C-1 candidate species for listing action priority, no action on the mouse is expected during Fiscal Year 1996 (pers comm O. Bray, USFWS).

Preble's meadow jumping mouse has been recorded in significant numbers in riparian shrubland and riparian woodland habitats along the major streamside corridors and around pond margins at the Site. The mouse has also been captured in association with some tall upland shrubland units (*Crataegus* sp. and *Prunus* sp.) at the Site. Current data indicate that the Rocky Flats population may be one of the larger known populations. Ongoing trapping at the Site continues to furnish data on the locations of populations and habitat affinities of the mouse. Spring 1996 trapping efforts gathered further information on emergence dates and habitats for mice leaving hibernation. The first mouse, a male, was recorded out of hibernation on May 10, 1995. Additional spring data, which agreed with emergence behavior of other small mammals (pers comm B. Wunder, CSU), indicated that males emerge first, followed by females. Results of 1995 trapping efforts may be found in the Preliminary Draft of Investigations of the Ecology and Ethology of the Preble's Meadow Jumping Mouse at the Rocky Flats Environmental Technology Site 1995 Field Season (PNHS/CSU 1996) and Study Results of Dam Toe Slope Sand/Rock Blanket Installation (DOE 1996a). Figure 5 shows general areas where Preble's meadow jumping mice have been captured since 1991. Data used in the creation of Figure 5 were derived from the Baseline Biological Characterization (DOE 1992), the report on the surveys for Preble's Jumping Mouse from 1992 and 1993 (ESCO 1993b), and the above-referenced reports.

Colorado Species of Special Concern

Long-billed curlews are casual visitors to the Site during migration. The Site is not within traditional summering or breeding grounds, but suitable foraging habitat exists. The individuals observed on-site have apparently been on rest stop-overs during migration.

American white pelicans have been observed at several impoundments on the Site during the spring and summer seasons. Suitable nesting habitat does not exist at the Site. This species uses impoundments at the Site as foraging habitat.

Sandhill cranes are frequently observed flying over the Site during spring and fall migrations. While suitable foraging habitat exists and stop-overs may occur at the Site, no individuals of this species have been observed on the ground foraging. The traditional wintering and summering grounds are hundreds of miles distant from the Site.

Watch-Listed Species

Other sensitive or special-concern species that are tracked at the Site include some species that the Colorado Natural Heritage Program has "watch-listed," or that the Colorado Division of

Wildlife are especially interested in, but that have not yet been officially added to the list of Colorado Species of Special Concern. These species include the golden eagle (*Aquila chrysaetos*), sharp-shinned hawk (*Accipiter striatus*), prairie falcon (*Falco mexicanus*), black-crowned night heron (*Nycticorax nycticorax*), long-eared owl (*Asio otus*), northern harrier (*Circus cyaneus*), eared grebe (*Podiceps nigricollis*), merlin (*Falco columbarius*), Cooper's hawk (*Accipiter cooperii*), northern leopard frog (*Rana pipiens*). One pair of black-crowned night herons has been documented as nesting at Pond D-1 since 1994. The other species use the Site as foraging territory seasonally, as a migration stopover, or during casual visits.

As of the spring of 1996, the Colorado Division of Wildlife (CDOW) has started to closely monitor the numbers of breeding pairs of Swainson's hawks (*Buteo swainsonii*). This is the result of a massive die-off of the species at one of its winter roosts in South America. The apparent cause of the deaths was poisoning due to consumption of poisoned grasshoppers. Some of the dead birds were banded in the Denver to Fort Collins area. CDOW raptor experts have initiated a census of nesting pairs of the species for 1996 to try to determine the impact of this die-off on the local Swainson's hawk populations (pers. comm. K. Green and J. Craig, CDOW). One pair of Swainson's hawks has nested near Pond A-1 during the last three breeding seasons (1994-1996). A second pair documented as breeding in lower Woman Creek during 1995 has not returned to the Site in 1996. This species will be closely monitored at the Site during the remainder of 1996.

TABLE 1. SPECIAL-CONCERN SPECIES SEARCH-LIST FOR THE ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

Federal Endangered Species Known to Occur at Rocky Flats

Birds

American Peregrine Falcon (*Falco peregrinus*)¹

Federal Threatened Species Known to Occur at Rocky Flats

Bald Eagle (*Haliaeetus leucocephalus*)²

Federal Candidate Species Known to Occur at Rocky Flats

Herptiles

Eastern Short Horned Lizard (*Phrynosoma douglassii brevirostra*)³ (Former C-2)⁴

Birds

Northern Goshawk (*Accipiter gentilis*)⁵ (Former C-2)⁴

Baird's Sparrow (*Ammodramus bairdii*)⁵ (Former C-2)⁴

Western Burrowing Owl (*Athene cunicularia hypugea*)³ (Former C-2)⁴

Ferruginous Hawk (*Buteo regalis*)³ (Former C-2)⁴

Black Swift (*Cypseloides niger*)⁵ (Former C-2)⁴

Loggerhead Shrike (*Lanius ludovicianus*)³ (Former C-2)⁴

Mammals

Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*)^{3 6} (Former C-2)⁴

Small-footed Myotis (*Myotis subulatus* = *M. ciliolabrum*)⁵ (Former C-2)⁴

Colorado Species of Special Concern Known to Occur at Rocky Flats

Birds

Long-billed Curlew (*Numenius americanus*)⁵

American White Pelican (*Pelecanus erythrorhynchos*)³

Federal Endangered Species with Potential Habitat at Rocky Flats

Birds

Whooping Crane (*Grus americana*)

Least Tern (*Sterna antillarum*)

Piping Plover (*Charadrius melodus*)

Mammals

Black-footed Ferret (*Mustela nigripes*)⁷

Federal Threatened Species with Potential Habitat at Rocky Flats

Plants

Ute Ladies'-tresses (*Spiranthes diluvialis*)⁷

Insects

Pawnee Montane Skipper (*Hesperia leonardus montana*)

TABLE 1. CONTINUED

Federal Candidate Species with Potential Habitat at Rocky Flats

Plants

- Colorado Butterfly Plant (*Gaura neomexicana* var. *coloradensis*) (C-1)
- Bell's Twinpod (*Physaria bellii*) (Former C-2)⁴
- Tulip Gentian (*Eustoma grandiflora*) (Former C-2)⁴
- Adder's Mouth Orchid (*Malaxis brachypoda*) (Former C-2)⁴

Insects

- Regal Fritillary (*Speyeria idalia*) (Former C-2)⁴

Fish

- Plains Topminnow (*Fundulus sciadicus*) (Former C-2)⁴

Birds

- Western Snowy Plover (*Charadrius alexandrinus nivosus*) (Former C-3C)⁴
- Mountain Plover (*Charadrius montanus*) (C-1)
- Black Tern (*Chlidonias niger*) (Former C-2)⁴
- Southwestern Willow Flycatcher (*Empidonax traillii extimus*) (C-1)
- White-faced Ibis (*Plegadis chihi*) (Former C-2)⁴

Mammals

- Spotted Bat (*Euderma maculatum*) (Former C-2)⁴
- Long-eared Myotis (*Myotis evotis*) (Former C-2)⁴
- Fringed Bat (*Myotis thysanodes*) (Former C-2)⁴
- Long-legged Myotis (*Myotis volans*) (Former C-2)⁴
- Pale Townsend's Big-eared Bat (*Plecotus townsendii pallescens*) (Former C-2)⁴
- Plains Spotted Skunk (*Spilogale putorius interrupta*) (Former C-2)⁴
- Swift Fox (*Vulpes velox*)⁷ (Former C-2)⁴

Colorado Species of Special Concern with Potential Habitat at Rocky Flats

Fish

- Common Shiner (*Notropis cornutus*)
- Stonecat (*Noturus flavus*)

Birds

- Barrow's Goldeneye (*Bucephala islandica*)
- Plains Sharp-tailed Grouse (*Tympanuchus phasianellus jamesi*) (S-E)⁹
- Greater Sandhill Crane (*Grus canadensis tibida*)⁵

Watch-Listed Species

Herptiles

- Northern Leopard Frog (*Rana pipiens*)

Birds

- Golden Eagle (*Aquila chrysaetos*)
- Sharp-Shinned Hawk (*Accipiter striatus*)
- Prairie Falcon (*Falco mexicanus*)
- Black-Crowned Night Heron (*Nycticorax nycticorax*)
- Long-Eared Owl (*Asio otus*)
- Northern Harrier (*Circus cyaneus*)

TABLE 1. CONTINUED

Eared Grebe (*Podiceps nigricollis*)

Merlin (*Falco columbarius*)

Cooper's Hawk (*Accipiter cooperii*)

- 1) The species *Falco peregrinus* is listed as endangered wherever found in the coterminous 48 states. Some subspecies are listed separately.
- 2) The USFWS has down-listed the Bald Eagle to threatened status.
- 3) This species is resident or regularly visits Rocky Flats.
- 4) In February 1996, the U.S. Fish and Wildlife Service (USFWS) revised the list of candidate species to include only proposed and C-1 species. All former C-2 candidate species are still considered special-concern species by Site ecologists. The search-list includes these species because they may be upgraded to C-1 species at any time.
- 5) The species has been observed infrequently at Rocky Flats.
- 6) A petition to list this species was reviewed by the USFWS. The 90-Day Finding found this petition to have merit, and the USFWS may pursue listing of the species.
- 7) This species was previously collected near Rocky Flats.
- 8) These species have historically used areas in the vicinity, and suitable feeding or residential habitat exists at Rocky Flats.
- 9) State Endangered (S-E).

Candidate Species

Note: Candidate species lists are under constant revision. As data are reviewed by the USFWS, species are added to and removed from this list on a year-round basis.

C-1 species are those species for which the USFWS has substantial data on file to support listing as threatened or endangered.

Former C-2 species are those species for which the USFWS has data on file to indicate that proposal for listing as threatened or endangered is possibly appropriate.

Sources

Colorado State Species of Concern are identified in the Colorado Natural Heritage Program list of Rare and Imperiled Animals, Plants, and Natural Communities, May 1995 (CNHP 1995).

Federal Register, February 28, 1996, pp. 7596-7613 (USFWS 1996).

TABLE 2 SPECIAL-CONCERN SPECIES USE SUMMARY, BASED ON COMBINED DATA FROM 1993, 1994, AND 1995

SEASON	SPECIES	RF GRID N	RF GRID E	NUMBER OF OBSERVATIONS
SP	AMERICAN WHITE PELICAN (1)	3	R	26
SU	AMERICAN WHITE PELICAN	3	R	1
SP	AMERICAN WHITE PELICAN	3	S	1
SU	AMERICAN WHITE PELICAN	4	R	26
SU	AMERICAN WHITE PELICAN	7	P	3
SU	AMERICAN WHITE PELICAN	13	Q	9
SU	AMERICAN WHITE PELICAN	16	P	18
WI	BALD EAGLE (2)	1	R	1
WI	BALD EAGLE	2	T	1
FA	BALD EAGLE	5	T	1
FA	BALD EAGLE	6	G	2
WI	BALD EAGLE	6	J	1
WI	BALD EAGLE	7	F	1
FA	BALD EAGLE	7	L	1
WI	BALD EAGLE	9	K	2
WI	BALD EAGLE	9	R	1
FA	BALD EAGLE	10	Q	1
FA	BALD EAGLE	11	N	1
WI	BALD EAGLE	11	N	1
WI	BALD EAGLE	12	S	1
WI	BALD EAGLE	13	Q	1
WI	BALD EAGLE	13	R	1
WI	BALD EAGLE	14	G	2
WI	BALD EAGLE	14	H	1
WI	BALD EAGLE	15	J	1
WI	BALD EAGLE	15	O	1
WI	BALD EAGLE	15	T	1
WI	BALD EAGLE	16	I	1
WI	BALD EAGLE	16	J	2
WI	BALD EAGLE	17	L	3
WI	BALD EAGLE	17	P	1
SU	BLACK-CROWNED NIGHT HERON (3)	2	T	3
SP	BLACK-CROWNED NIGHT HERON	3	R	3
SU	BLACK-CROWNED NIGHT HERON	3	R	9
SP	BLACK-CROWNED NIGHT HERON	3	S	1
SU	BLACK-CROWNED NIGHT HERON	3	S	1
SU	BLACK-CROWNED NIGHT HERON	4	R	1
SP	BLACK-CROWNED NIGHT HERON	4	S	8
SU	BLACK-CROWNED NIGHT HERON	7	N	2
SU	BLACK-CROWNED NIGHT HERON	7	P	4
SU	BLACK-CROWNED NIGHT HERON	11	P	1
SP	BLACK-CROWNED NIGHT HERON	12	Q	1
SU	BLACK-CROWNED NIGHT HERON	12	Q	3
SU	BLACK-CROWNED NIGHT HERON	13	T	3

TABLE 2. CONTINUED

SEASON	SPECIES	RF GRID N	RF GRID E	NUMBER OF OBSERVATIONS
SU	GOLDEN EAGLE	2	Q	2
FA	GOLDEN EAGLE	2	T	2
WI	GOLDEN EAGLE	2	T	1
SP	GOLDEN EAGLE	2	T	2
SU	GOLDEN EAGLE	2	T	2
SU	GOLDEN EAGLE	2	T	2
FA	GOLDEN EAGLE	3	O	1
FA	GOLDEN EAGLE	3	P	1
FA	GOLDEN EAGLE	3	R	1
SU	GOLDEN EAGLE	3	R	2
SP	GOLDEN EAGLE	3	U	2
SU	GOLDEN EAGLE	4	F	2
WI	GOLDEN EAGLE	4	L	1
SU	GOLDEN EAGLE	4	M	2
FA	GOLDEN EAGLE	4	P	2
WI	GOLDEN EAGLE	4	P	3
SP	GOLDEN EAGLE	4	P	2
SP	GOLDEN EAGLE	4	S	2
WI	GOLDEN EAGLE	4	T	2
SP	GOLDEN EAGLE	4	U	2
SP	GOLDEN EAGLE	5	I	2
WI	GOLDEN EAGLE	5	P	1
WI	GOLDEN EAGLE	5	Q	1
SP	GOLDEN EAGLE	5	Q	4
FA	GOLDEN EAGLE	5	R	2
WI	GOLDEN EAGLE	5	R	1
WI	GOLDEN EAGLE	5	T	1
SP	GOLDEN EAGLE	6	O	2
SU	GOLDEN EAGLE	6	O	2
SP	GOLDEN EAGLE	6	P	2
FA	GOLDEN EAGLE	7	F	1
FA	GOLDEN EAGLE	7	H	1
SP	GOLDEN EAGLE	7	R	2
SP	GOLDEN EAGLE	8	M	2
SP	GOLDEN EAGLE	8	N	2
FA	GOLDEN EAGLE	8	N	1
SP	GOLDEN EAGLE	9	C	2
SP	GOLDEN EAGLE	9	K	2
FA	GOLDEN EAGLE	9	L	1
WI	GOLDEN EAGLE	9	M	1
SU	GOLDEN EAGLE	9	T	2
WI	GOLDEN EAGLE	10	O	1
FA	GOLDEN EAGLE	10	Q	1
WI	GOLDEN EAGLE	10	Q	1

TABLE 2. CONTINUED

SEASON	SPECIES	RF GRID N	RF GRID E	NUMBER OF OBSERVATIONS
SU	GOLDEN EAGLE	11	M	2
SU	GOLDEN EAGLE	11	N	2
WI	GOLDEN EAGLE	11	P	1
WI	GOLDEN EAGLE	11	Q	1
WI	GOLDEN EAGLE	11	R	1
SU	GOLDEN EAGLE	11	S	4
WI	GOLDEN EAGLE	12	O	1
SP	GOLDEN EAGLE	12	O	2
FA	GOLDEN EAGLE	12	R	2
WI	GOLDEN EAGLE	12	S	4
WI	GOLDEN EAGLE	12	T	2
WI	GOLDEN EAGLE	13	G	1
FA	GOLDEN EAGLE	13	H	1
FA	GOLDEN EAGLE	13	K	1
SP	GOLDEN EAGLE	13	O	2
SP	GOLDEN EAGLE	13	R	2
SP	GOLDEN EAGLE	13	S	2
SU	GOLDEN EAGLE	13	S	2
WI	GOLDEN EAGLE	14	H	1
SU	GOLDEN EAGLE	14	I	2
WI	GOLDEN EAGLE	14	J	1
WI	GOLDEN EAGLE	14	M	1
FA	GOLDEN EAGLE	15	G	1
WI	GOLDEN EAGLE	15	H	1
FA	GOLDEN EAGLE	15	I	1
FA	GOLDEN EAGLE	15	P	1
SP	GOLDEN EAGLE	15	P	2
SU	GOLDEN EAGLE	15	S	2
FA	GOLDEN EAGLE	16	I	2
SU	GOLDEN EAGLE	16	J	2
WI	GOLDEN EAGLE	16	O	1
SP	GOLDEN EAGLE	16	O	2
SP	GOLDEN EAGLE	16	P	6
SP	GOLDEN EAGLE	16	Q	2
WI	GOLDEN EAGLE	17	K	1
SP	GOLDEN EAGLE	17	K	2
SP	GOLDEN EAGLE	17	M	2
WI	GOLDEN EAGLE	17	O	1
FA	GOLDEN EAGLE	17	P	2
SP	LOGGERHEAD SHRIKE (4, 5)	4	P	1
SP	LOGGERHEAD SHRIKE	6	I	1
SU	LOGGERHEAD SHRIKE	7	F	1
FA	LOGGERHEAD SHRIKE	7	H	1
SP	LOGGERHEAD SHRIKE	7	I	1

TABLE 2. CONTINUED

SEASON	SPECIES	RF GRID N	RF GRID E	NUMBER OF OBSERVATIONS
FA	LOGGERHEAD SHRIKE	7	L	2
FA	LOGGERHEAD SHRIKE	7	M	1
SU	LOGGERHEAD SHRIKE	8	F	1
FA	LOGGERHEAD SHRIKE	11	E	1
SU	LOGGERHEAD SHRIKE	11	E	3
SU	LOGGERHEAD SHRIKE	14	G	2
SU	LOGGERHEAD SHRIKE	14	I	2
FA	LOGGERHEAD SHRIKE	15	G	1
WI	LOGGERHEAD SHRIKE	17	K	1
SU	LOGGERHEAD SHRIKE	17	K	1
SP	LONG-BILLED CURLEW (1, 5)	11	F	6
SP	LONG-BILLED CURLEW	15	L	1
WI	LONG-BILLED CURLEW	16	O	1
SP	LONG-EARED OWL (6)	7	N	2
SU	LONG-EARED OWL	14	G	2
FA	LONG-EARED OWL	15	J	5
SP	MERLIN (5)	4	G	1
SP	MERLIN	4	G	1
WI	MERLIN	11	E	1
WI	NORTHERN GOSHAWK (4, 5)	2	F	1
WI	NORTHERN GOSHAWK	2	G	1
SP	NORTHERN GOSHAWK	15	K	2
SU	NORTHERN HARRIER (6)	2	J	2
FA	NORTHERN HARRIER	2	S	1
FA	NORTHERN HARRIER	2	T	2
SP	NORTHERN HARRIER	2	T	2
FA	NORTHERN HARRIER	2	U	1
SP	NORTHERN HARRIER	2	U	2
FA	NORTHERN HARRIER	3	R	1
WI	NORTHERN HARRIER	3	R	1
WI	NORTHERN HARRIER	4	K	1
SP	NORTHERN HARRIER	4	L	2
SU	NORTHERN HARRIER	4	M	2
FA	NORTHERN HARRIER	4	T	1
FA	NORTHERN HARRIER	5	F	1
SP	NORTHERN HARRIER	5	G	2
FA	NORTHERN HARRIER	5	H	1
FA	NORTHERN HARRIER	5	I	1
WI	NORTHERN HARRIER	5	I	2
SU	NORTHERN HARRIER	5	I	2
FA	NORTHERN HARRIER	5	J	1
WI	NORTHERN HARRIER	5	J	1
FA	NORTHERN HARRIER	5	O	1
SP	NORTHERN HARRIER	5	P	2

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TABLE 2. CONTINUED

SEASON	SPECIES	RF GRID N	RF GRID E	NUMBER OF OBSERVATIONS
SU	NORTHERN HARRIER	5	P	2
FA	NORTHERN HARRIER	6	H	1
FA	NORTHERN HARRIER	6	I	2
WI	NORTHERN HARRIER	6	I	1
FA	NORTHERN HARRIER	6	J	2
WI	NORTHERN HARRIER	6	J	1
SU	NORTHERN HARRIER	6	J	2
FA	NORTHERN HARRIER	6	K	1
WI	NORTHERN HARRIER	6	K	2
SP	NORTHERN HARRIER	6	K	2
FA	NORTHERN HARRIER	6	P	1
WI	NORTHERN HARRIER	7	F	2
FA	NORTHERN HARRIER	7	K	1
WI	NORTHERN HARRIER	7	K	1
FA	NORTHERN HARRIER	7	M	1
WI	NORTHERN HARRIER	7	M	1
FA	NORTHERN HARRIER	7	N	1
FA	NORTHERN HARRIER	7	O	1
FA	NORTHERN HARRIER	7	P	1
SU	NORTHERN HARRIER	7	P	2
SU	NORTHERN HARRIER	8	G	2
FA	NORTHERN HARRIER	8	L	1
WI	NORTHERN HARRIER	8	P	1
FA	NORTHERN HARRIER	10	D	1
FA	NORTHERN HARRIER	10	H	1
FA	NORTHERN HARRIER	10	O	1
FA	NORTHERN HARRIER	10	Q	2
FA	NORTHERN HARRIER	11	E	1
WI	NORTHERN HARRIER	11	F	1
WI	NORTHERN HARRIER	11	N	1
SU	NORTHERN HARRIER	11	N	2
WI	NORTHERN HARRIER	11	P	1
FA	NORTHERN HARRIER	11	R	1
FA	NORTHERN HARRIER	12	F	1
WI	NORTHERN HARRIER	12	F	2
SU	NORTHERN HARRIER	12	G	2
FA	NORTHERN HARRIER	12	N	1
FA	NORTHERN HARRIER	12	O	1
WI	NORTHERN HARRIER	12	O	1
FA	NORTHERN HARRIER	12	P	1
FA	NORTHERN HARRIER	12	S	1
SU	NORTHERN HARRIER	12	S	8
WI	NORTHERN HARRIER	13	F	1
FA	NORTHERN HARRIER	13	G	4

TABLE 2 CONTINUED

SEASON	SPECIES	RF GRID N	RF GRID E	NUMBER OF OBSERVATIONS
WI	NORTHERN HARRIER	13	G	1
SU	NORTHERN HARRIER	13	G	2
FA	NORTHERN HARRIER	13	H	1
WI	NORTHERN HARRIER	13	H	1
FA	NORTHERN HARRIER	13	K	1
FA	NORTHERN HARRIER	13	L	2
FA	NORTHERN HARRIER	13	P	2
WI	NORTHERN HARRIER	13	Q	1
WI	NORTHERN HARRIER	13	R	1
FA	NORTHERN HARRIER	13	S	1
SP	NORTHERN HARRIER	13	S	2
FA	NORTHERN HARRIER	14	G	2
WI	NORTHERN HARRIER	14	G	1
SU	NORTHERN HARRIER	14	G	2
FA	NORTHERN HARRIER	14	H	2
FA	NORTHERN HARRIER	14	I	2
SU	NORTHERN HARRIER	14	I	4
FA	NORTHERN HARRIER	14	J	5
FA	NORTHERN HARRIER	14	N	1
SP	NORTHERN HARRIER	14	R	2
FA	NORTHERN HARRIER	14	S	1
SU	NORTHERN HARRIER	14	T	2
FA	NORTHERN HARRIER	14	U	1
SU	NORTHERN HARRIER	15	F	2
FA	NORTHERN HARRIER	15	G	1
FA	NORTHERN HARRIER	15	H	1
FA	NORTHERN HARRIER	15	I	1
FA	NORTHERN HARRIER	15	J	1
SU	NORTHERN HARRIER	15	K	2
FA	NORTHERN HARRIER	15	O	1
FA	NORTHERN HARRIER	15	P	2
WI	NORTHERN HARRIER	17	N	1
WI	PEREGRINE FALCON (7)	13	P	1
FA	PEREGRINE FALCON	12	F	1
SP	PEREGRINE FALCON	4	L	2
SP	PEREGRINE FALCON	4	R	1
SP	PEREGRINE FALCON	7	P	1
FA	PRAIRIE FALCON (6)	5	I	1
FA	PRAIRIE FALCON	7	I	2
SP	PRAIRIE FALCON	9	E	2
SP	PRAIRIE FALCON	11	G	2
WI	PRAIRIE FALCON	13	F	1
FA	PRAIRIE FALCON	14	R	1
FA	PRAIRIE FALCON	15	P	1

TABLE 2. CONTINUED

SEASON	SPECIES	RF GRID	RF GRID	NUMBER OF OBSERVATIONS
		N	E	
WI	PRAIRIE FALCON	15	Q	1
FA	PRAIRIE FALCON	17	O	1
FA	SHARP-SHINNED HAWK (6)	2	T	1
SP	SHARP-SHINNED HAWK	5	P	2
SP	SHARP-SHINNED HAWK	7	I	2
SP	SHARP-SHINNED HAWK	8	C	2
SP	SHARP-SHINNED HAWK	8	N	2
SU	SHARP-SHINNED HAWK	14	F	2
FA	NORTHERN LEOPARD FROG (1, 5, 6)	12	L	1
SU	EASTERN SHORT-HORNED LIZARD (4)	3	O	1
SU	EASTERN SHORT-HORNED LIZARD	12	S	1

FOOTNOTES

- 1) Colorado State "Species of Special Concern"
- 2) Species listed federally as "Threatened"
- 3) Colorado Division of Wildlife is tracking breeding population of this species
- 4) Species that were formerly listed by the U S Fish and Wildlife Service as a C-2 candidate for listing This listing was revised in February 1996 to include only C-1 candidates and "Proposed" species
- 5) Species classified by the U S Forest Service as "Sensitive" due to current or predicted downward population trends
- 6) Species "Watch-listed" by the Colorado Natural Heritage Program
- 7) Species listed federally as "Endangered"

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- DOE 1996b *1995 Annual Wildlife Survey Report, Natural Resources Protection and Compliance Program* Golden, Colorado April 25, 1996
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U S Congress 1958

USFWS 1996 *Federal Register, Vol 61, No 40 Proposed Rules*, pp 7596 - 7613 United
States Government Printing Office February 28, 1996

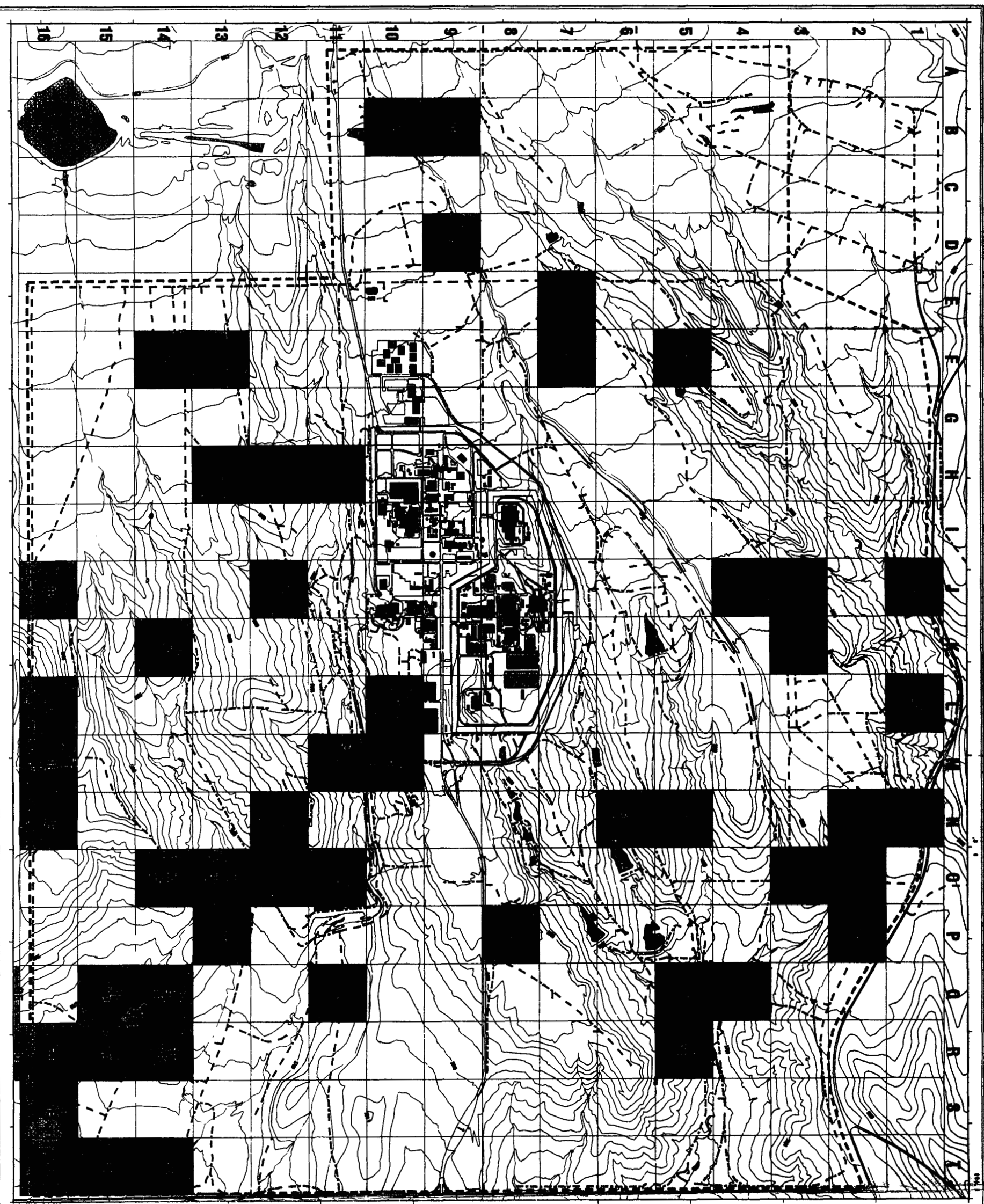
Personal Communication, Kathi Green, Biologist, and Jerry Craig Raptor Specialist, Colorado
Division of Wildlife June 7, 1996

Personal Communication, Olin Bray, Endangered Species Biologist, U S Fish and Wildlife
Service June 4, 1996

Personal Communication, Bruce Wunder, Mammologist, Colorado State University October 15,
1995

Personal Communication, Janet George, Biologist, Colorado Division of Wildlife April 1994

Special Concern Species
Area Use in Spring, Based on
Data from 1993, 1994, and 1995
Figure 1



EXPLANATION

Location of Special Concern Species

- GE Golden Eagle
- SH Sharp-Shinned Hawk
- PR Prairie Falcon
- PE Peregrine Falcon
- LC Long-tailed Curlew
- PH Ferruginous Hawk
- NG Northern Goshawk
- BS Black Swift
- BO Burrowing Owl
- SH Black-crowned Night Heron
- LO Long-eared Owl
- NH Northern Harrier
- LS Loggerhead Shrike
- EG Eastern Grebe
- WP Western White Pelican
- ML Mallard

Standard Map Features

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Contours (20' intervals)
- Rocky Flats boundary
- Paved roads
- Dirt roads

DATA SOURCES:
Topographic maps and photos provided by
Rocky Flats Environmental Technology Site
Inventory conducted by
Rocky Flats Environmental Technology Site



Scale = 1:21,330
1 inch represents approximately 1,778 feet



State Plane Coordinate Projection
Colorado Central Zone
Datum NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by



Rocky Mountain
Remediation Services, LLC
1000 West 10th Avenue, Suite 100
Golden, CO 80602-4441

MAP ID: x8882

May 28, 1996

Special Concern Species
Area Use in Summer, based on
Data from 1993, 1994, and 1995

Figure 2

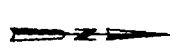
EXPLANATION

- Location of Special Concern Species
- Long-eared Owl
- Loggerhead Shrike
- Golden Eagle
- American White Pelican
- Black-crowned Night Heron
- Eastern Short Horned Lizard
- Northern Harrier
- Sharp-shinned Hawk

Standard Map Features

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Contours (20' intervals)
- Rocky Flats boundary
- Paved roads
- Dirt roads

DATA, SURVEYS, and MAPS provided by
Rocky Mountain Research Services, Inc. 1995
Map data provided by
USGS, 1995



Scale = 1:21,330
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State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Rocky Mountain
Research Services, LLC
Map Data Provided by
USGS, 1995

Special Concern Species
Area Use in Fall, Based on
Data from 1993, 1994, and 1995

Figure 3

- EXPLANATION**
- Location of Special Concern Species
- GE Golden Eagle
BE Bald Eagle
FH Ferruginous Hawk
NH Northern Harrier
LS Loggerhead Shrike
LO Long-eared Owl
BO Burrowing Owl
CH Cooper's Hawk
PE Peregrine Falcon
PR Prairie Falcon
NL Northern Leopard Frog
EG Great Egret
SH Sharp-shinned Hawk

- Standard Map Features**
- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Contours (20' intervals)
- Rocky Flats boundary
- Paved roads
- Dirt roads

DATA SOURCES:
Topographic maps and names provided by
Rocky Flats Field Station, Inc.
Aerial photography provided by
Rocky Flats Field Station, Inc.



Scale = 1" = 21330 feet
1 inch represents approximately 1778 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

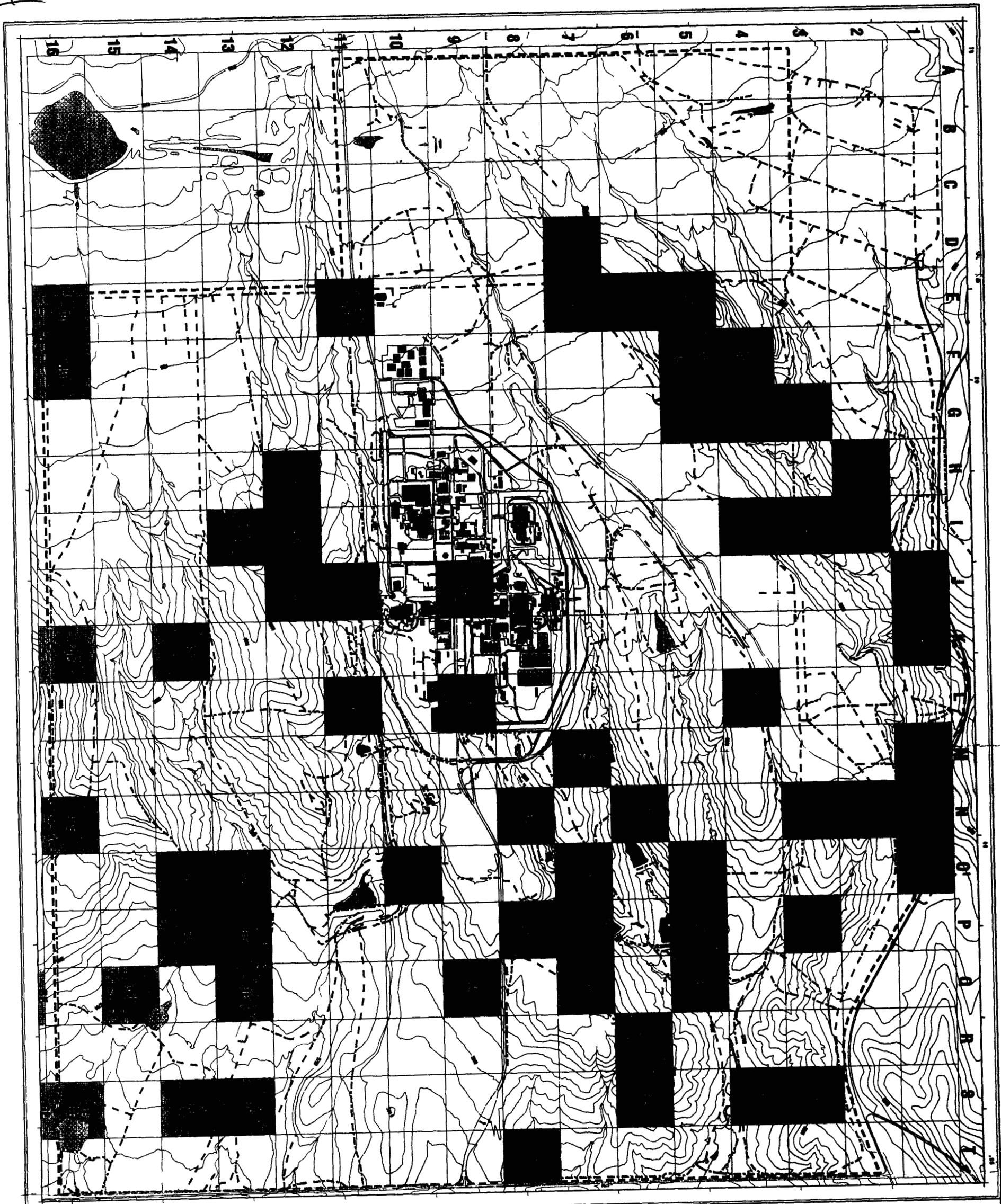
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Rocky Flats Environmental Technology Site



Rocky Mountain
Remediation Services, LLC
Geographic Information Systems Group
1000 17th Avenue, Suite 100
Boulder, CO 80502-4441

Special Concern Species
Area Use in Winter, Based on
Data from 1993, 1994, and 1995

Figure 4



EXPLANATION

Location of Special Concern Species

- NH Northern Harrier
- GE Golden Eagle
- BE Bald Eagle
- FH Ferruginous Hawk
- ME Merriam
- PE Peregrine Falcon
- PR Prairie Falcon
- LS Loggerhead Shrike
- LC Long-tailed Curlew
- NG Northern Goshawk

Standard Map Features

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Contours (20' intervals)
- Rocky Flats boundary
- Paved roads
- Dirt roads

DATA SOURCES:
Aerial photography and maps provided by
Rocky Mountain Research, Inc. 199
Map data provided by
Rocky Mountain Research, Inc. 1999



Scale = 1:21,330
1 inch represents approximately 1778 feet



Sirri Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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Rocky Flats Environmental Technology Site

Prepared by



Rocky Mountain Research Services, LLC
Geographic Information Systems Group
1000 17th Avenue, Suite 100
Golden, CO 80601-4441

MAP ID: x0892

May 29, 1999

**General Locations
of Preble's Meadow
Jumping Mouse
Captures - 1991 to 1996**

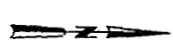
Figure 5

EXPLANATION

- General Capture Areas
- Standard Map Features
 - Buildings or other structures
 - Lakes and ponds
 - Streams, ditches, or other drainage features
 - Fences
 - Contours (20 intervals)
 - Rocky Flats boundary
 - == Paved roads
 - - - Dirt roads

DATA SOURCES:
Topographic, aerial, and historic provided by
Rocky Mountain Remediation Services, LLC
Hydrology provided by
USGS (1990) (1995) (2000)

Disclaimer: These are preble mouse capture
area locations only. This map is not to be
interpreted as a preble mouse habitat map.



Scale = 1" = 21330 feet
1 inch represents approximately 1778 feet



State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

**U.S. Department of Energy
Rocky Flats Environmental Technology Site**

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